United States Department of Agriculture
Forest Service
Stanislaus National Forest
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Reply To: 3420

Date: July 1, 1994

Subject: Insect and Disease Evaluation of Lodgepole Pine Areas Proposed for Treatment to Reduce/Prevent Mountain Pine Beetle-related Mortality, Minarets RD, Sierra NF (FPM Report No. C94-4).

To: Forest Supervisor, Sierra NF

On June 15, 1994, John Wenz (Entomologist) and John Pronos (Plant Pathologist), FPM South Sierra Shared Service Area, visited several lodgepole pine stands located in the north end of the Minarets RD. They were accompanied by Mike Price and Dave Smith of the District. These stands are proposed for treatments intended to prevent/reduce unacceptable levels of lodgepole pine mortality associated with the mountain pine beetle (MPB), Dendroctonus ponderosae (Coleoptera: Scolytidae). The purpose of the visit was to assess the appropriateness of the planned treatments, supported, in part, by FPM Insect and Disease Suppression funds, with respect to effectively preventing/reducing unacceptable MPB effects.

The stands proposed for treatment cover approximately 1000 acres in the vicinity of Miller and Jackass Meadows (T5S, R24E, S 13, 14, 22, 24). They consist primarily of lodgepole pine with red and/or white fir prevalent in some stands. There are scattered Jeffrey and sugar pine pine in the overstory. There has been little past management of these areas except for occasional small clearcuts along roads, and the untreated stands are generally very dense. The project is planned for a 5 to 10 year period with about 100 acres scheduled for treatment in FY94. This MPB mortality prevention project is considered part of an approximately 2,000 acre ecosystem management project being planned by the District to reduce fuels, improve forest health and help diversify the local economy by providing a source of wood for special forest products industries.

Mountain pine beetle-related lodgepole pine mortality has been observed throughout the area since the early 1980's with increasingly higher levels occurring over the past 5 to 6 years. Mortality from a single MPB generation has typically occurred in 2 to 10 tree groups of intermediate, co-dominant and dominant lodgepole pine that range from about 12 to 26 inches DBH. The mortality groups do not appear to expand in place from one generation or one year to the next. However, through time, attacks by different generations of bark beetles have resulted in 2 to 5 acre patches of lodgepole mortality. In addition, top-kill and mortality in overstory true fir, likely due to attack by the fir engraver, Scolytus ventralis, was scattered throughout the area.

Lodgepole pine dwarf mistletoe (Arceuthobium americanum) was present in several of the stands we visited, but the distribution and degree of infection over the entire project area varied greatly. In heavily infected areas both overstory



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and understory pines had mistletoe. Silvicultural prescriptions and marking guides should include provisions for the reduction of dwarf mistletoe when it is present in a stand. In general, infected overstory lodgepole pine should be removed if lodgepole pine is to be retained in the understory. If the understory is also infected, it can be sanitized using the thinning guides included at the end of this report. At a minimum, lodgepole pines with Hawksworth ratings of 5 or 6 should be removed from the overstory because they are often easy targets for MPB attacks, and they produce abundant seeds that can spread the mistletoe. More lodgepole pine overstory infection can be tolerated on sites where true fir will be the favored understory species. (Red and white fir are not susceptible to lodgepole pine dwarf mistletoe.)

Western gall rust (Peridermium harknessii) was found on lodgepole pine in a few stands. Symptoms included large "hip" cankers on the lower boles of mature trees and galls on branches and stems of seedlings and saplings. This disease is not of major concern except that it can cause mortality in small trees, and, therefore, infected trees could be removed during treatment.

Several factors have apparently interacted to increase the susceptibility of the conifers to bark beetle attack. They include: 1) overstocking due to effective fire suppression and lack of stand management (stocking levels vary from <100 sq.ft./ac. in areas where mortality has occurred to 350 sq.ft./ac.); 2) generally below normal precipitation over the past 4-6 years; and 3) diseases, primarily lodgepole pine dwarf mistletoe.

Treatments proposed by the District include commercial and precommercial thinning and some species conversion through overstory removal. They will likely be effective in reducing/preventing MPB mortality and are appropriate for FPM funding support. Thinning to levels appropriate for the site based on local experience should increase the vigor of the residual trees through reduction of between-tree competition and removal of trees infected with dwarf mistletoe and western gall rust. Removal of overstory lodgepole pine in selected areas to favor manageable stands of advanced true fir reproduction would provide some species diversity and help reduce the number of contiguous acres of suitable MPB hosts.

John M. Wenz
Entomologist

John Pronos
Plant Pathologist

cc: DR:Minarets RD, Sierra NF
J.Neisess:RO/S&PF/FPM

## APPENDIX - Dwarf Mistletoe Thinning Guidelines For Pines

When thinning pine plantations or natural regeneration, one of the two methods below can be used to identify leave trees. Remember that these guides are only appropriate when overstory sources of dwarf mistletoe infection have been eliminated.

Method 1.

| Crop Tree DBH in Inches | Maximum Dwarf Mistletoe Rating* Tolerated |
|---|---|
| 1 - 2 | 0 |
| 3 - 4 | 1 |
| 5 - 6 | 2 |
| 7+ | 3 |

*Hawksworth 6-Class rating system

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Method 2.

1. Trees less than 2" dbh: no infections

2. Trees more than 2" dbh: (Follow the order below for crop trees)

   1-Dom and co-dom trees with NO INFECTIONS.

   2-Dom and codom trees, DM in lower 1/3 crown.

   3-Dom and codom trees, DM in lower 1/2 crown. and less than 50% of the branches infected.

   4-Intermediate trees with NO INFECTIONS.

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